

Process for packaging cigarettes, and cigarette pack

The invention relates to a process for packaging cigarettes according to the preamble of claim 1 and to
5 a cigarette pack according to the preamble of claim 20.

EP 0 545 723 A1 discloses a process for producing hinged-lid cigarette packs with rounded sides, i.e. an oval cross section. For this purpose, use is made of a
10 single-piece blank or of two part-blanks in order to form a double layer. In order for it to be possible to form the rounded sides, the side-wall flaps of the blanks are provided with a multiplicity of scores, arranged one beside the other and extending in the
15 longitudinal direction of the pack, and, moreover, are produced from correspondingly thick paper or cardboard with a basis weight of usually $> 200 \text{ g/m}^2$ in order to ensure the stability of the pack, since the pack is only held together by the base-closure and top-closure
20 flaps adhesively bonded to one another. On the one hand, stressing which occurs when the pack is folded is intended to be intercepted by the scores; on the other hand, however, it has been found that it is additionally necessary to use hot glue in order to
25 overcome this problem. The production of such a pack is thus both complicated and material-intensive.

WO 99/02428 discloses the practice of producing a hinged-lid cigarette pack with oval cross section from
30 an inner blank and an outer blank, which are likewise both provided beforehand with corresponding scores in the side-wall regions, the inner blank being folded, and adhesively bonded via a closure flap, in the first instance, whereupon the outer blank is folded around
35 the folded inner blank and adhesively bonded via a closure flap. Quite apart from the fact that full-surface-area adhesive bonding, with the corresponding consumption of adhesive and associated drying problems, takes place here, this does not eliminate the above

disadvantages.

EP 0 414 532 B1 discloses the practice of producing a hinged-lid cigarette pack with oval cross section from two blanks which are fixed to one another by a narrow adhesive strip, are likewise scored in the side-wall region and are folded around a mandrel such that the two blanks are offset in relation to one another in a seam region on the rear side of the pack, this resulting in the formation of a merely three-layered seam, in the region of which the adhesive bonding takes place. There is no interconnection between the layers. The above disadvantages are not eliminated in this case either.

Finally, EP 0 411 223 B1 discloses the practice of producing a hinged-lid cigarette pack with oval cross section by producing a correspondingly double-walled tube into which closure caps are inserted at the base and lid.

The object of the invention is to provide a process according to the preamble of claim 1 which makes it possible to eliminate the stressing occurring in rounded wall regions during production of the pack and/or to produce the pack with reduced material consumption.

This object is achieved according to the defining part of claim 1.

Since two layers of the pack are connected to one another over the entire surface area, or at least over the entirety of mutually facing surface areas, in an essentially uniform connecting or adhesive pattern, it is possible to eliminate the stressing from the bent regions of the pack and, even when relatively thin paper is used for the layers, to achieve sufficient dimensional stability despite the pack being produced

with reduced material consumption.

This makes it possible to produce packs with rounded, non-scored side-wall regions, with the result that a
5 smooth outer surface of the pack is achieved.

In particular, it is expedient to use an adhesive pattern of cold glue in conjunction with paper layers, the moisture of the cold glue assisting to a
10 considerable extent the operation of eliminating the stressing from the paper layers. However, the adhesive pattern should be configured here such that use is made of as little cold glue as possible, in order, on the one hand, to restrict the quantity of the latter used
15 and, on the other hand, to preclude a necessity for excessive drying time.

It is expedient to apply the adhesive in an in particular stabilizing strip pattern, it being possible
20 for the strips to be at least partially interrupted, in order to provide a corresponding grid arrangement. The strip pattern is preferably applied essentially in the direction in which the rounding of the corresponding wall extends.

25 It is possible to produce cigarette packs, with or without a hinged lid, with a more or less elongate-oval to virtually circular or else kidney-shaped cross section.

30 If appropriate, it is possible to dispense with the inner paper, usually a paper laminated with aluminium foil or a metalized plastic sheet, if there is arranged between the two layers a corresponding material which
35 connects the two layers, for example a double-sided adhesive sheet or the like. Paper and cardboard are to be understood in the present context not just as corresponding cellulose materials, but also as other paper-like materials, for example laminated papers or

plastic sheets which can be used instead of paper or cardboard in the present context.

Further configurations of the invention can be gathered
5 from the following description and the subclaims.

The invention is explained in more detail hereinbelow with reference to the exemplary embodiments illustrated in the attached figures, in which:

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Figures 1 and 2 show two part-blanks for a hinged-lid outer pack for a cigarette pack,

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Figure 3 shows, schematically, part of the process for producing the outer pack from the part-blanks of figures 1 and 2,

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Figure 4 shows a finished cigarette pack made of the part-blanks of figures 1 and 2,

Figures 5 and 6 show two further part-blanks for a hinged-lid outer pack.

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The part-blank 21 for a hinged-lid pack which is illustrated in figure 1 comprises a front-side flap 1 and a rear-side flap 2, between which a side-wall flap 3 is arranged. A further side-wall flap 4 together with a narrow closure flap 5 are located on the longitudinal side of the front-side flap 1. Located on the narrow sides of the front-side flap 1 and of the rear-side flap 2 are base-closure and lid-closure flaps 6', 6'' and 7', 7'', respectively, which are shaped to correspond to the later cross section of the hinged-lid pack which is to be produced. In this exemplary embodiment, they are oval. A plurality of adhesive tongues 8 are located on the narrow sides of the side-wall flaps 3, 4. Moreover, for the subsequent formation of a cutout which makes it easier to remove cigarettes at a later stage, a cut line 9 extends, in

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accordance with the subsequent opening edge of the hinged-lid pack, parallel to the narrow side of the front-side flap 1 and then obliquely over most of the side-wall flaps 3, 4, in order then to run parallel again to the narrow side of the side-wall flaps 3, 4, on the one hand, up to the closure flap 5 and, on the other hand, up to a bending line 10 in the central region of the rear-side flap 2, later forming the lid articulation of the hinged-lid pack, and, on the other side of the folding line 10, as far as the free border of the rear-side flap 2. In the region of the closure flap 5, the cut line 9 continues to the free border of the same by way of a perforated section 11. The base-closure and top-closure flaps 6', 7', which are located on the outside when the hinged-lid pack is in the finished state, are expediently somewhat larger than inner base-closure and top-closure flaps 6'', 7''.

The part-blank Z2 illustrated in figure 2 comprises a front-side flap 12 and a rear-side flap 13, side-wall flaps 14 and 15 being arranged adjacent to the front-side flap 12 in each case, and the side-wall flap 14 adjoining the rear-side flap 13. The side-wall flaps 14, 15 are rounded on the lid-side border. Furthermore, a tongue 18 is connected to the side-wall flaps 14, 15 and the front-side flap 12 via bridges 16 in a collar cutout 17. An articulated flap 19 is located, on the side of the tongue 18, on the narrow side of the rear-side flap 13. A narrow closure flap 20 is arranged on the longitudinal side of the side-wall flap 15.

Unless described to the contrary, the individual flaps are connected to one another by pre-scored folding lines.

The two part-blanks Z1, Z2 may consist of a paper or thin cardboard, in particular with a basis weight in the range of approximately 120 to 150 g/m², it being possible for the part-blanks Z1, Z2 to consist of paper

or thin cardboard which is the same or of different thicknesses. The part-blanks Z1, Z2 have a high level of flexibility such that they can be bent, without scoring, in accordance with the envisaged rounding of the base-closure and top-closure flaps 6', 7'.

It is also possible, however, for the two part-blanks Z1, Z2 to consist of somewhat thicker cardboard, for example with a basis weight of approximately 200 g/m² or above although, even in this case, they do not require any scoring since stressing can be eliminated from the bent regions of the pack, even then, by the envisaged adhesive bonding of the part-blanks Z1, Z2.

According to the exemplary embodiment illustrated schematically in figure 3, two magazines Z1, Z2 are provided in each case for one of the two part-blanks Z1, Z2. The part-blanks Z1 are guided over a gluing roller 23 which has gluing segments 24 which are arranged parallel to one another, extend over a predetermined length corresponding to the length of the part-blank Z1 and are provided with glue via a glue-application roller 25, which penetrates into a cold-glue bath 26.

The glued part-blanks Z1 are made to coincide with the part-blanks Z2 on a conveying path for the latter which runs perpendicularly to the gluing and conveying path for the part-blanks Z1, the part-blanks Z2 previously having been deformed along the folding lines adjacent to the front-side flap 12 such that the front-side flap 12 and the tongue 18 are raised in relation to the rest of the areas of the part-blanks Z2, with the result that it is only said front-side flap which comes into contact with the front-side flap 1 of the part-blank Z1 and is adhesively bonded thereto.

In order that the two part-blanks Z1, Z2 do not slip in relation to one another here, it is expedient for the

part-blanks to be fixed in relation to one another during their partial adhesive bonding. For this purpose, it is possible to provide, for example, pins which pierce the bottom part-blank Z2 and, when the
5 part-blank Z2 is pushed on, stick into the latter, for example through up to approximately half the thickness, but, as far as possible, do not go all the way through.

The part-blanks Z1, Z2 connected in this way are then
10 folded over around a cell 27, for example, of a cell turret, the outside of the cell 27 being shaped essentially to correspond to the subsequent hinged-lid pack, i.e. having an oval cross section in the present exemplary embodiment. During the folding-over
15 operation, it is not just the further side-wall and rear-side flaps of the blanks Z1, Z2, but also the closure flaps 5, 20, which are adhesively bonded, this resulting, in the first instance, in a box which is open on the two narrow sides. Thereafter, the adhesive
20 tongues 8 and the base-closure flaps 6', 6'' are then folded over, and adhesively bonded to one another, in a conventional manner in further stations of the cell turret, with the result that a box which is open just at the lid is seated on the cell 27. A cigarette block
25 29 wrapped in an inner paper 28, usually paper laminated with aluminium foil, can then be pushed into said box in the cell 27, and the resulting pack can be pushed, for example, into a cell of a following turret, where the pack is closed at the lid. This gives a pack
30 as is illustrated in figure 4. The pack may then be wrapped in a clear film with tear-open strips.

Although it is preferred for the part-blanks to be adhesively bonded, in the first instance, just on the
35 front-side flaps 1, 12, this can also take place, instead, on the rear-side flaps 2, 13.

The part-blanks Z1, Z2 are thus preferably adhesively bonded to one another, in the first instance, just in

the region of one flap, in the exemplary embodiment illustrated in the region of the front-side flaps 1, 12, in order that bending of the side-wall flaps 3, 4, 14, 15 does not result in any buckling or stressing in the inner blank Z2 on account of the somewhat smaller radius of curvature.

In contrast to the above exemplary embodiment of figure 3, however, it is also possible for the part-blanks Z1, Z2 to be adhesively bonded to one another for the first time on the cell 27, as a result of which the occurrence of stressing is likewise avoided.

In the case of part-blanks Z1, Z2 made of paper or relatively thin cardboard, in order to reduce the material consumption, the adhesive bonding, which according to figure 3 takes place in a strip pattern which extends transversely to the longitudinal axis of the cigarettes which are subsequently introduced into the pack, results in corresponding stiffening and thus in the stability which is required for the pack, in order to avoid the possibility of cigarettes which are later located in the pack being damaged during normal handling. Arranging the strip pattern in the manner described generally achieves a greater level of stability than with a strip pattern in the direction perpendicular thereto. Instead of the strip pattern, however, it is also possible to use a pattern of dots, a pattern of criss-crossing lines or adhesive bonding over the entire surface area.

Figure 5 shows a further embodiment of the part-blank Z1. In this case, the base-closure and lid-closure flaps 6'' and 7'' are absent and, instead, the base-closure and lid-closure flaps 6', 7' of the front-side flap 1 have a narrow adhesive flap 30 on their free edges. Moreover, in each case one adhesive flap 31 may be provided, if appropriate, for stabilizing purposes on the narrow sides of the rear-side flap 2.

It is also possible to select a different shape for the adhesive tongues 8, as is illustrated in figure 5.

- 5 The embodiment shown in figure 5 can be used instead of that shown in figure 1.

Figure 6 shows a further embodiment of the part-blank Z2, in the case of which the articulated flap 19 and the closure flap 20 have been omitted. This embodiment
10 can be used in conjunction with a part-blank Z1 from figure 1 or 5.

Instead of two part-blanks Z1, Z2, it is also possible
15 to use a single blank which is formed, for example, such that two part-blanks Z1, Z2 from one of figures 1, 2, 5 and 6 are connected to one another along a folding line such that the rear-side flaps 2, 13 are located adjacent to one another.

20 In this case, it is expedient if this single-piece blank, in the first instance, is folded along the folding line separating the two rear-side flaps 2, 13, it also being possible, at the same time, for the rear-side flaps 2, 13 to be adhesively bonded to one
25 another, while the rest of the flaps are advantageously retained without any adhesive bonding.

The partial adhesive bonding both of the part-blanks
30 Z1, Z2 and of the single-piece blank may also have already been carried out beforehand, with the result that they can be removed from a magazine in a correspondingly adhesively bonded state..

35 For a hinged-lid pack, it is expedient if corresponding swing-out tabs are present for the lid, in order for the latter to be retained in its closed position once the pack has been opened. These tabs may be provided correspondingly on the respective part-blank Z2 or on

that part of a single-piece blank which corresponds to this part-blank. Since said swing-out tabs, in this respect, are single-layered, it is possible, in the case of thin cardboard or paper, for this to result in the swing-out tabs being too weak to fulfil their function. It is then possible, however, to cut out larger swing-out tabs and/or to reinforce the latter and/or to increase their stability by corresponding bending.

Instead of applying cold glue, as is described in conjunction with the exemplary embodiment of figure 3, it is also possible, for the purpose of adhesively bonding the two layers, to use an adhesive which is applied during the packaging operation, or even beforehand, and can be activated by heat and/or pressure and/or ultrasound for adhesive-bonding purposes. If appropriate here, the adhesive may be covered by a sheet, which has to be drawn off for adhesive bonding. This adhesive may also be applied in the form of a sheet or of coated paper, i.e. of an adhesive web, during the packaging operation or beforehand, it being possible for the sheet or the paper to have additional functions, for example being impermeable to water vapour and/or serving for reinforcing purposes or the like.

It is expedient if the seam location at which the layers of the two part-blanks Z1, Z2 abut is formed with an at most three-layered overlap. In particular in the case of a hinged-lid pack, it is expedient if the seam is arranged adjacent to the end of the lid articulation, i.e. runs at least outside the region of the articulation by means of which the hinged load is articulated.

Although the above exemplary embodiment concerns a cigarette pack with a hinged lid, it is also correspondingly possible to produce a cigarette pack

with top closure flaps which are provided with a tear-open section in order to gain access to the cigarettes. It is also possible to provide a separate push-on lid instead of a hinged lid.

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In the case of an oval or a kidney-shaped cross section, the cigarette block may be adapted to this cross-sectional shape, but it may also be cuboidal or essentially cuboidal, with the result that a free space
10 remains in the rounded lateral regions, it being possible for this free space to serve for accommodating smoking-related utensils, such as matches, or to serve as a space for accommodating ash and filters. In this case, the cigarette block may be retained on the inner
15 layer of the outer paper by the inner paper and/or by corresponding tabs.

It is possible for the cigarettes to be arranged in the cigarette pack not just with their longitudinal axes
20 running in the direction from the base-closure flaps to the removal opening located opposite, but also transversely thereto.